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(54) Title: CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD

(57) Abstract

A customer relationship management system and method provides and implements a multi–phase closed–loop approach, including specifying, analyzing, designing, executing, and tracking operations associated with a marketing campaign. Marketing campaigns are developed based on defined constraints, and subdivided according to segments and cells. Full support for distinct marketing channels, each having unique characteristics, is provided.

CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD

Inventors:
Evangelos Simoudis
Mayank Prakash

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates generally to software for marketing applications, and more particularly to a system and method of planning and implementing customer relationship management.

2. Description of Background Art

Historically, marketing techniques relied on individual contact between the proprietor and each customer of a business. Because of the personal relationship that was able to develop in such an environment, the proprietor knew all of his or her customers and could provide personal service to them. For example, in a banking environment, where the proprietor was a banker, he or she would keep track of the needs and means of each customer, how much credit risk each customer represented, how to maintain customer satisfaction in a individualized way, and other characteristics.

Large-scale customer service operations and stores no longer have the luxury of such individual contact. Stores, banks, and other such establishments are able to maintain customer satisfaction, to some extent, by attempting to classify customers into groups, and treating all customers in each group alike. This segmentation is applied to the services and products offered to customers, as well as to the marketing efforts employed to attract and maintain customers. Much of this marketing is done through mass media, which results in a loss of the ability to distinguish among individual customers and potential customers. Another common marketing technique is direct mail, wherein an offer is mailed to a large number of prospective customers. Direct mail marketing techniques suffer from many of the same problems listed above. In addition, these large-scale techniques tend to diminish the capability

of building long-term relationships, instead treating each transaction as a separate, isolated event.

As marketing tactics and techniques become more complex, the tasks of maintaining, tracking, and developing customer relationships become more difficult.

5   Marketeers have relied upon a combination of tools, including databases, expert systems, decision support software, and the like, to perform customer relationship management functions. In many cases, these diverse tools and techniques do not operate in an integrated manner; as a result, inefficiencies are introduced and customer relationships suffer. Marketing resources are not used efficiently.

10   Customers may receive conflicting and/or contradictory messages from the same organization, the wrong market segments may be targeted, potential customers may be missed, or existing customers may be driven off through error or mistreatment.

Such problems and pitfalls are often caused by the failure of existing tools to provide a systematic, closed-loop customer relationship management system. Several

15   tools are available for decision support and customer tracking, such as Valex from Exchange Applications, Analytix from Experian's Customer Insight Group, P/CIS from Harte Hanks, and Pinnacle from Harland, among others. In addition, other database-driven tracking systems are available for performing various types of analysis and breakdowns of customer data; these include, for example Model1 from

20   Unica, SAS Enterprise Miner, SPSS, and the like. Limited campaign management support is available from products such as Vales from Exchange Applications, Prime Vantage from Prime Response, and the like. None of these systems, however, provides an integrated approach that can use the data to design a customer relationship management plan, and execute and track the results of the plan.

25   What is needed is a system that can manage the complete life cycle of a customer relationship management project. What is further needed is a system that provides software tools for use in all phases of customer relationship management in an integrated manner. What is further needed is a software system and method that can maximize results in customer relationship management by performing

specification, analysis, design, execution, and tracking functionality for the entire life cycle. What is further needed is a software system and method capable of integrating analytics such as data mining, predictive modeling, statistical and OLAP processing, neural networks, and the like, into a single framework designed to support the life cycle of customer relationship management.

SUMMARY OF THE INVENTION

In accordance with the present invention, there is provided a system and method of planning and implementing customer relationship management that address the above limitations of the prior art. The present invention thus enables businesses to employ economies of scale of larger operations and institutions, so as to reduce costs, while retaining the ability to tailor product and service offerings, as well as marketing efforts, to individual customers. The invention thus promotes the building of long-term relationships with customers, rather than treating each interaction as a stand-alone transaction. This is beneficial for both the business establishment and its customers: customer loyalty is enhanced, which reduces customer development costs; improved targeting of marketing campaigns reduces customer acquisition costs; and customers feel that the business is becoming more responsive to their needs and treating them as individuals.

The present invention accomplishes these goals by using a multi-phase closed-loop approach to customer relationship management operations. Five phases are implemented, although in alternative embodiments a different number of phases may be implemented. In general, the five phases track the complete life cycle of a database marketing project, including specification, analysis, design, execution, and tracking.

The specification phase includes defining the goal of the marketing project, defining constraints, and defining the customer universe. The analysis phase includes developing and scoring market segments, and validating constraints and goals. The design phase includes creating "cells" (described below), assigning offers to cells, and assigning channels through which to make the offers. The execution phase includes defining output formats, establishing a campaign schedule, and de-

livering data to channel databases. Finally, the tracking phase includes posting the responses to the offers made in this campaign, analyzing this data, and adjusting the campaign accordingly.

Each of these phases is described in more detail in the Detailed Description of the Preferred Embodiments. In alternative embodiments, the phases may include different sub-phases than those listed here, without departing from the spirit or essential characteristics of the claimed invention.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a diagram of the overall flow of the method of the present invention.

Fig. 2 is a flow diagram of a specification phase according to one embodiment of the present invention.

Fig. 3 is a flow diagram of an analysis phase according to one embodiment of the present invention.

Fig. 4 is a flow diagram of a design phase according to one embodiment of the present invention.

Fig. 5 is a flow diagram of an execution phase according to one embodiment of the present invention.

Fig. 6 is a flow diagram of a tracking phase according to one embodiment of the present invention.

Fig. 7 is a block diagram of a system architecture according to one embodiment of the present invention.

Fig. 8 is a block diagram showing operation of a segmentation module.

Fig. 9 is a block diagram showing operation of a scoring module.

Fig. 10 is a flowchart showing a method of testing the quality of a selected predictive model.

Fig. 11 is a block diagram showing operation of a campaign manager module.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The techniques of the present invention can be applied to both product-centric and customer-centric campaigns and programs. In product-centric campaigns, the

user's focus is to identify the customers or households that will be targeted for a particular product or service. Such an approach may be used most commonly, for example, for one-step single-channel campaigns such as direct-mail campaigns. In some cases, product-centric methodologies may also be used for multi-step and/or

5   multi-channel campaigns.

In customer-centric campaigns, the user's focus is to identify the most appropriate products to be offered to a particular customer or household, and through what sequence of offers and channels to approach the customer. Such campaigns tend to be more complex than corresponding product-centric campaigns.

10   Though the description provided below presents the present invention in terms of customer-centric marketing campaigns, the techniques may also be applied to software for a product-centric campaign.

Referring now to Fig. 1, there is shown a diagram of the overall flow of a method according to one embodiment of the present invention. This flow is

15   presented as a database marketing project life cycle, having five phases: specification phase 101, analysis phase 102, design phase 103, execution phase 104, and tracking phase 105. Each phase will be described in turn, in terms of a user practicing the present invention. As will be understood by those skilled in the art, the steps of the present invention can be performed by an automated system, such as a software

20   application.

In one embodiment of the present invention, in the course of performing the phases depicted in Fig. 1, the invention evaluates customers and/or prospective customers in terms of a number of metrics to establish their current positions in a multi-dimensional conceptual space. The customers are also evaluated with respect

25   to their predicted positions in this space at some user-defined time. As will be seen below, specification, segmentation and other tasks are performed with respect to positions and potential positions in this space. This measurement and evaluation process allows the user to gauge the relative success or failure of an ongoing campaign and to make adjustments to the campaign plan accordingly.

Referring now to Fig. 2, there is shown a flow diagram of specification phase 101, according to one embodiment of the present invention. Specification phase 101 begins by defining 201 the marketing campaign's overall goal. For example, a goal in a customer-centric campaign might be to increase the profitability of its low-profit but

5   high-potential customers by 20% in eighteen months. This might be achieved through a single campaign or through a series of related campaigns.

If applicable, customers are characterized by their position in a multi-dimensional space with each axis measuring a particular parameter such a profitability, loyalty, risk level, and the like. The campaign's goal is defined in terms

10   of a position in the multi-dimensional customer space, with each specific goal corresponding to a distinct position in the space, thus defining a path to the desired position. The goal is realized by moving the customers within this space.

The goal of the campaign is expressed as the desired value of a target variable. Constraints on achieving the target value may be defined 202, to represent other

15   business goals or restrictions. For example, for the customer-centric campaign discussed above, one constraint might be to focus only on a particular geographic area, and to avoid using loan products due to the company's asset/liability situation.

For a product-centric campaign, for example, if the campaign goal is to add new credit card customers, one strategy might be to offer no-interest credit cards.

20   Although such a strategy would achieve the immediate goal of adding new credit customers, it would defeat the overall purpose of increasing profits, since revenue from interest payments would be eliminated. A constraint such as "do not reduce total company profits in the campaign" could be put into effect to eliminate the strategy.

25   In one embodiment, constraints are represented in the system as restrictions on values of parameters. For example one constraint might be represented as:

TOTAL_COMPANY_PROFITS_BEFORE <=

TOTAL_COMPANY_PROFITS_AFTER   (Eq. 1)

This constraint specifies that the profits must not decrease as a result of the marketing campaign. The constraint can be checked both during the analysis and design phases, 102, 103, by comparing the predicted total profits to the initial profits, or during the tracking phase 105 by comparing the actual total profits to the initial

5   profits.

Another example of a constraint might be:

CAMPAIGN_CONTRIBUTION_TO_COMPANY_PROFITS >= 0

(Eq. 2)

This constraint specifies that the campaign have a positive contribution to

10   company profits. Checking the constraint of Eq. 2 can be accomplished using domain knowledge, which is embedded in the system so as to facilitate such constraint evaluation.

Step 202 may also include, as an additional constraint, specifying a budget for the campaign, or for a set of related campaigns. Such a budget takes into account the

15   various costs of executing the campaign, processing the responders, and maintaining the responders. Specific examples include mailing costs, credit check costs, monthly statements, and the like.

The invention then includes defining 203 the customer universe that will be targeted through the campaign and the products that will be offered in these markets.

20   For example, the campaign might target households that have secured a mortgage to purchase their first residence in the last six months. Particular products, such as gold and platinum versions of a particular credit card, might be offered to such households.

Referring now to Fig. 3, there is shown a flow diagram of analysis phase 102

25   according to one embodiment of the present invention. In this phase, the invention analyzes the goal of the campaign and determines its feasibility. Analysis phase 102 verifies that the goal can be met within the constraints set in specification phase 101, and in one embodiment determines what sequences of promotions are to be applied to each customer to achieve the goal.

The system measures and records variables that measure customers, as well as variables that measure campaign parameters such as response rates, budgets, expected and actual expenses, and the like. Variables can be classified into two categories — independent variables, which can be directly controlled, and dependent

5   variables, which are controllable indirectly by modifying directly controlled variables. Generally, target variables are dependent variables.

The central problem addressed by the marketing campaign is to find values for independent variables that will meet the campaign goal, while satisfying the defined constraints. In performing this function, the invention employs calculators and

10   reports to generate relevant values for dependent variables. Calculators include mechanisms for performing analysis by performing various calculations on variables, such as the break-even calculator described below.

Reports are a mechanism allowing the user to interactively modify parameters and see the effects on other parameters, in a "what if" form of analysis. Reports

15   display various parameters of interest to the user in a visually meaningful manner, such as a graph, spreadsheet, or chart. The user can modify certain variables and see the results of such changes, in a manner similar to a spreadsheet application. Reports are supported by a set of calculators and models. The calculators are used to compute dependent variables, while the models provide the ability to predict values

20   for variables. In one embodiment, such models operate using known statistical methods.

Analysis phase 102 begins by performing an exploratory analysis 308. This may include, for example, a break-even analysis to determine the expected break-even point for the campaign. Based on the cost of contacting each potential customer,

25   and the expected profit from each acquired customer, a target response rate is determined.

One example of a break-even calculator is shown in Table 1:

Campaign's financial target	$1,500,000.00
Expected average annual revenue per customer	$100.00
Target mail response rate	1%
Target telephone response rate	10%
Percent of prospects targeted through mail	30%
Percent of prospects targeted through telephone	70%
Cost per mail prospect	$1.00
Cost per telephone prospect	$0.80
Processing cost per customer	$2.00
Number of customers needed	*15,000*
Number of customers to be approached	*555,000*
Amount needed for the campaign	*$564,000.00*
Gross profit	*$963,000.00*

Table 1: A top-down break-even calculator

Table 1 shows a "top-down" calculator, in that it takes as input the various costs and the campaign goal, and calculates the needed budget for the campaign.

5   Alternatively, a bottom-up calculator can be employed, which starts with the campaign budget and determines if the campaign goals can be met. More sophisticated analysis may also be performed, including for example, taking into account attrition figures and other factors. Also, other types of calculators may be employed, as will be apparent to those skilled in the art.

10   Analysis phase 102 continues by defining 301 the segments in the identified market that will be targeted by the campaign. For example, first-year college students may be one segment. Segments may also be defined by other means, such as geographic criteria, income levels, family size, home ownership, and the like. These segments are scored with respect to certain criteria, such as risk, propensity to accept

an offer, and the like. Scoring includes determining a score for each segment that measure a particular characteristic, such as the propensity to buy a product, the likelihood of defecting within a year, and the like. For example, one such segment might be defined as "households with no children and low credit risk that have taken

5   a mortgage to purchase their first residence in the last six months."

Segments can be defined in a variety of ways, including for example:

- Applying a query to the customer universe, or another segment

- Combining two or more segments

- Selecting a quartile or a decal based on a score

10 - Randomly or manually removing customers from a segment

- Removing customers that are duplicated in another segment, or in another campaign

Each segment has its own characteristics, such as response rate, channel sensitivity, propensity to purchase different products, and the like. To take into

15 account these characteristics in order to determine likely success or failure of the campaign, a correlation model may be used.

Correlation models capture empirical relationships among variables, and may be used when direct relationships are not known. Correlation models are built using a variety of techniques, including statistical analysis, neural networks, rule-based

20 systems, and the like. In the present invention, such relationships are captured in a set of predictive models that model common relationships. One example is a predictive model that predicts whether a household or customer will accept a particular offer of a particular product, such as a gold credit card. In one embodiment, predictive models are employed to capture correlation models.

25 Based on the cost of contacting each potential customer, and the expected profit from each acquired customer, a target response rate is determined.

In an alternative embodiment, a dependency network may be used to describe dependency relationships among variables. A dependency network is defined when a formula is used to derive a variable from one or more other variables. The

dependency network traces such dependencies, and establishes a precise relationship among variables. Such a relationship can then be used to perform analysis on the campaign and gauge its likelihood of success according to defined goals and parameters. In one embodiment, dependency networks are captured in the

5   calculators.

In one embodiment, step 301 also includes defining the number and type of campaigns that will be executed on each segment. This substep may be performed for each defined product of the campaign, or for each established customer or customer segment. For example, the no-children low-risk households mentioned

10   above might be targeted with two campaigns, such as an awareness campaign followed by a solicitation campaign.

In one embodiment, step 301 also includes determining methods and channels for each campaign. This determination is made based on the break-even analysis and capacity availability of each channel to accommodate the workload imposed by the

15   campaigns. Following the example being discussed, the gold and platinum credit cards might be offered through direct mail and telephone solicitation.

In one embodiment, a product path assignment for each segment may be developed as well. The product path assignment is a sequence of products that will be offered successively to the customers in a segment, in an effort to meet the

20   campaign goals. The product path assignment is based on a report that shows, for each customer:

- the products currently owned
- the profitability from those products
- the propensity of the customer to buy each additional product

25   - the expected profitability from each of those products

From this report, the user can determine the optimal sequence of products to offer the customers in each segment, in order to maximize the contribution to the campaign goals, while meeting relevant constraints.

Analysis phase 102 also includes validating 304 the constraints and goals of the marketing campaign. This includes, for example, identifying any conflicts between the products offered in the campaign and products offered by any other campaigns already in production, possibly by other parts of the same organization. This step

5   attempts to avoid sending conflicting offers or messages to potential customers. The expected success of the campaign in terms of the defined goal is assessed. If the goal is not satisfied 306, analysis phase 102 returns to step 308. If the goal is satisfied 306, the phase ends 307.

In one embodiment, analysis phase 102 takes place in accordance with

10   positions and potential positions of customers in the multi-dimensional space described above. Customers are segmented according to their real and potential positions. A path through the multi-dimensional space is determined, that takes the customers from the current position to a position that will satisfy the campaign goal.

In one embodiment, the path through multi-dimensional space is implemented

15   using a set of predictive models 901. For example, a "propensity to buy" model may be applied to each customer to determine which product he or she is most likely to buy. Additional predictive models (such as a "profitability model", a "risk analysis model", a "loyalty index model", and the like) may then be applied to determine where such a purchase will lead the customer in the multi-dimensional space. This

20   determines the first step in the path for each customer. Next, the "propensity to buy" model may be applied to each customer again, but this time with the assumption that the first product has already been purchased. Repeating the process results in a series of steps on the path that the customer is likely to follow. The user can decide that he or she would like the customer to follow a different path, in which case the models

25   provide information that is helpful in designing new products and campaigns that will steer the customer along the desired path.

Referring now to Fig. 4, there is shown a flow diagram of design phase 103 according to one embodiment of the present invention. Design phase 103 begins by selecting 404 a market segment and organizing 401 the segment into smaller groups

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called "cells". The members of a cell receive the same offer. A cell is thus the smallest unit of customers that is the target of a promotion. An example of a cell is the top five percent (in terms of profitability) of the no-children, low-risk households; another example is a random sample of ten percent of the entire segment. Cells are specified

5   in terms of filters or queries applied to a segment that may include, for example:

- sampling (nth, random, or stratified)
- fixed quantity, percent (quantiles, deciles, etc.), nth factor
- ranking based on scores
- duplication (members of a selected cell that also belong to other cells)

10   In one embodiment, cells are further refined 405 using a set of business rules. For example, a rule might state "do not promote a customer more than once every three months."

A promotion is then created 406 and associated 402 with each cell. For example, the cell containing the top five percent of the most profitable households

15   might be offered a platinum credit card with no interest for one year and a $15,000 credit limit. A channel is assigned, through which the offer will be made (such as telephone solicitation, direct mail, and the like). By taking into account the size of the cell, and the capacity of the assigned channel, the present invention is able to ascertain whether the assigned channel is able to accommodate the task assigned to it.

20   Available channel capacity is measured during the time period the offer will be made.

Referring now to Fig. 5, there is shown a flow diagram of execution phase 104 according to one embodiment of the present invention. Output formats are specified 501 as required by each channel. The campaign schedule is then developed 502. Finally, the necessary data is delivered 503 to each channel so that the campaign can

25   be put into effect.

The format expected for the promotions depends on the channel. For example, a mail center may expect magnetic copies of mail-ready files in the format of their mailing software. A call center may expect scripts that the telephone representative will follow during conversations with prospective customers. An automated teller

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machine may expect different messages to be displayed when a customer inserts a bank card. Delivery of data 503 is performed according to the expected format for the channel being used.

5   Referring now to Fig. 6, there is shown a flow diagram of tracking phase 105 according to one embodiment of the present invention. Tracking phase 105 is performed by collecting 601 in a marketing database data about the results of the campaign; for example, the responses to the offers associated with the appropriate cell. Data is collected at some predetermined frequency, depending on the organization and on the channel being used. For example, data from call centers and

10   World Wide Web sites may be collected daily, if appropriate, while data for mail channels may be more suited for weekly collection. Based on the collected data, the campaign's effectiveness is analyzed 602 by cell, channel, and by product/offer. The campaign is then adjusted 603 based on the analyzed data, for greater effectiveness and/or efficiency.

15   In one embodiment, tracking phase 105 analyzes results in terms of the multi-dimensional space described earlier. Customer positions are compared with expected positions, to determine whether the campaign is on target, or if the path through the multi-dimensional space needs to be modified. This process is repeated for each step in the path, until the goal is met and the campaign is over. The campaign thus

20   consists of moving the customers through a series of steps to the target position.

Referring now to Fig. 7, there is shown a block diagram of a system architecture 700 according to one embodiment of the present invention, for performing the process described above. The architecture 700 shown in Fig. 7 may be implemented, for example, in a client/server computing environment. The client

25   portion runs under an operating system such as Windows 95, Windows 98, or Windows NT Workstation, all from Microsoft Corporation. The server portion runs, for example, under the Windows NT 4.0 operating system, also from Microsoft Corporation. Alternatively, a Unix-based server may be employed, particularly for larger volumes of data.

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The primary database for use in architecture 700 is customer data mart (CDM) 701, which may be implemented for example using SQL Server 6.5, Oracle 8.X for NT, or similar. A sharable meta-data layer may be implemented to permit all components to share data effectively, as is known in the art.

5   Data model 702 provides a framework for accessing and interpreting data from customer data mart 701. Data model 702 includes base attributes and derived attributes describing customers and potential customers. An example of data model 702, including base attributes and derived attributes, can be found in Appendix A. Data for data model 702 is determined based on the needs of various calculators and

10   reports of segmentation module 704, report analysis and data mining module 705, campaign manager module 706, and predictive model library 901.

       Data model 702 is designed to provide efficient and convenient access to many different types of information. In one embodiment, customer information is stored in a dimensional structure to facilitate analysis. The campaign and tracking information

15   is stored in relational tables. Derived data attributes are stored in denormalized and flattened tables for efficiency, if appropriate. Information in data model 702 is linked using appropriate keys, as needed.

       Data access layer 703 contains routines for accessing and manipulating data from data model 702 and CDM 701. Those skilled in the art will recognize that such

20   routines are generally known for such operations in connection with databases. Modules 704, 705, 706, and 901 may call routines from layer 703 as needed.

       Segmentation module 704 performs segmentation operations in connection with the marketing project life cycle, as will be explained in more detail below. Report analysis and data mining module 705 determines scores for market segments,

25   and makes the scores available to the user, as will be explained in more detail below. Campaign manager module 706 produces as its output a marketing campaign, as will be explained in more detail below.

       Graphical user interface 707 provides a front-end on the client computer for facilitating user access to the various functional modules of the overall system.

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Referring now to Fig. 8, there is shown a block diagram depicting operation of segmentation module 704 according to one embodiment. Segmentation module 704 accepts data from CDM 701 and data model 702 as input. Module 704 produces segments set 801, which contains descriptions of market segments for use in other

5 components of the system. Segments set 801 can be stored in CDM 701, or in file space of a client or server machine.

In one embodiment, module 704 accepts reports library 802 as input in generating segments set 801. Reports library 802 allows easy interaction with data from CDM 701 by facilitating the use of standardized reports. For example, two

10 types of reports may be included in library 802: customer understanding reports 803, which provide an assessment of the type and level of relationship between customers and the company; and campaign effectiveness reports 804, which provide analysis on the results of previously executed marketing campaigns so that the campaign can be refined and improved.

15 Examples of customer understanding reports include:

- Marketing Campaign Management Status / Tracking Report
- Cross-Sell Status Summary Report
- Product Combinations Status Report
- Household Detail Status Report
20 - Officer Assignment Status Report
- Portfolio Segment Migration Report
- Portfolio Household Detail Changes Report
- Cross-Sell Sequences Report
- Organizational Levels Performance Status Reports
25 - Product Status Comparisons Reports
- Organizational Levels Performance Trends Reports
- Portfolio Entities Performance Trends Reports

Examples of campaign effectiveness reports include:

- Campaign-Specific Incentives Effectiveness Report

- Campaign-Specific Customer Trends Report

- Up-Sell Campaigns Effectiveness Report

- Transaction Channels Status Report

- Transaction Channels Trends Report

- Transaction Activity Status Report

- Organizational Levels Performance Deviations Reports

- Cross-Sell and Product Bundling Performance Deviations Report

- Transaction Channels Status by Organizational Levels Reports

All of these reports are generated by performing calculations on data from CDM 701. Segmentation module 704 generates segments set 801 by performing two functions: selecting 805 a customer universe, and partitioning 806 the customer universe into segments. Selecting 805 involves defining a group of customers (individuals or households), which may include either the entire CDM 701 or a subset of the CDM 701. The user may specify such a subset through the use of a query, which may include inclusion and/or exclusion clauses. Alternatively, the subset may be defined in terms of a view in the CDM 701. Partitioning 806 is performed by defining specific criteria for one or more segments in the customer universe.

In one embodiment, segments are created interactively, in response to the user posing queries against the customer universe selected in 805 through a relational and/or multidimensional query tool. For example, a segment may be created by posing a relational query requesting all households that own two banking products. Segments may also be organized hierarchically, so that the segment defined as "household that own two banking products" may include additional defined segments such as "households that own two banking products and have a car" and "households that own two banking products and have a house".

Interactive segmentation as performed in 806 may be done in two substeps: quickcounts, and record realization. The quickcounts substep determines the size of each segment, so that the user can elect to reject a segment as being too large or too small before the records associated with the segment are actually retrieved from

CDM 701. The user may refine a query for a rejected segment in order to obtain better results, if desired.

During the record realization substep, the segments specified as "accepted" by the user are processed. An identification code is assigned to each accepted segment,

5   and the appropriate segment identification code is written to each record that belongs to the customer universe, as appropriate. Since a particular record may belong to more than one segment, and the user may elect to allow duplicate records in segments if desired, all appropriate identification codes must be associated with the corresponding record.

10   Once segmentation module 704 has performed the partition into segments, the segments are stored, for example at the client machine or in CDM 701. If stored in CDM 701, appropriate security is implemented for each segment so that only designated users may access, copy, and/or modify the segment.

Segmentation module 704 also provides graphic display of the distribution of

15   values of the records found within a particular segment. The user may specify the attributes whose values are to be displayed, and user interface 707 then displays the data in a graphical form. For example, the display may include a bar graph listing the number or percentage of potential customers belonging to several different groups forming the segment.

20   Other methods of segmentation, such as automated segmentation, may also be implemented in alternative embodiments. In one such embodiment, automated segmentation using predictive models, as described above, is employed. The customer universe is segmented according to the first most likely product to buy. Each segment is then subdivided according to the next most likely product to buy.

25   Continuing in this manner, a set of segments is developed, so that each segment follows along the same path in the multi-dimensional space.

An alternative technique for automated segmentation is based on known statistical clustering algorithms. A clustering algorithm breaks the customer universe into a set of clusters, so that the customers in each cluster are uniform with respect to

some criteria, and differ among different clusters according to the same criteria. These clusters then form the segments.

Referring now to Fig. 9, there is shown a block diagram depicting operation of report analysis and data mining module 705 according to one embodiment. Module

5   705 accepts input from segments set 801 (generated by segmentation module 704, as described above) as well as predictive model library 901. Output from report analysis and data mining module 705 is scored segments set 902 which may then be stored in CDM 701.

Predictive model library 901 contains a number of predictive models that may

10   be used in scoring segments. Predictive models predict the expected value of some parameter. Such models are built by analyzing data having known values for the target variable, incorporating the information about the correlation between the target variable and other variables. When applied to new target data, the model can then use the learned correlations to predict values for target variables.

15   For example, library 901 may include the following models:

- "Potential life-time value": Predicts net present value of a customer if he or she fully utilized all appropriate products and services
- "Propensity to buy product": Predicts likelihood that a customer will buy a product

20   - "Risk level": Predicts amount of risk associated with a customer
- "Loyalty index": Predicts likelihood that a customer will defect
- "Predicted response": Predicts likely response of a customer to a given offer

Report analysis and data mining module 705 performs two main functions in

25   generating scored segment set 902. It tests 903 the quality of a selected predictive model from library 901, and it applies 904 the selected predictive model to segments set 801.

Referring now to Fig. 10, there is shown a flowchart of a method of testing 903 the quality of a selected predictive model. The model is applied to a set of customers

for which the target variable has a known value. The results of the model are then compared against the known value to determine quality of the model.

First, module 705 accepts 1001 the user's selection of a model from library 901. Generally, the user selects a predictive model based on the type of task (acquisition, attrition, etc.) and the product (credit card, loan, etc.). Module 705 then accepts 1002 the user's selection of a data set with recorded response data. Next, module 705 accepts 1003 user selection of the attributes of the data set that will be pertinent to the model testing. Alternatively, all attributes can be selected as being pertinent. If any attributes have special meaning, the user can identify 1004 these. Module 705 then checks 1005 that the selected data and attributes conform to the model's specification. This includes, for example, checking that the names of the independent variables in the data set are the same as the corresponding attributes of the selected model, checking that the dependent variable is the same, and the like.

Next, module 705 applies 1006 the model to the selected data set and compares 1007 the model's predictions to the known responses. In one embodiment, these results are plotted graphically, such as through a gains chart. Finally, the system accepts 1008 the user's acceptance or rejection of the model based on the comparison.

The procedure of Fig. 10 may be repeated for each of the selected models.

Once the selected model is tested in 903, it can be applied 904 to segments set 801, according to known techniques in the art of predictive model application. A set of scores from the model is generated. The scores are written as separate values in each record in the selected segment, and stored in CDM 701 as appropriate.

Referring now to Fig. 11, there is shown a block diagram depicting operation of campaign manager module 706 according to one embodiment. Module 706 is used in design phase 103 and execution phase 104 of the marketing life cycle. Module 706 accepts as input either segments set 801 from segmentation module 704, or scored segments set 902 from report analysis and data mining module 705. Module 706 produces a marketing campaign 1101 including cells 1103, offers 1104, channels 1105,

and schedules 1106. Marketing campaign 1101 may also be related to or integrated with other marketing campaigns, as desired.

Marketing campaign 1101 is identified by a unique identifier. Typical data that may be associated with campaign 1101 may include, for example:

- 5 • the campaign owner

- • the campaign type (e.g. renewal, acquisition, cross-sell, and the like)

- • customer universe size

- • campaign budget

- • actual expenses

- 10 • forecast response

- • actual response

- • number of segments in campaign

- • number of cells in campaign

- • campaign duration

- 15 • channels used.

Each of the elements of marketing campaign 1101 will now be described. Cells 1103 are created, as described above, by applying various filtering criteria to segments. In one embodiment, the user may specify that module 706 should store in a temporary data source (such as a flat file) the number of customers that "fall off" a

20 campaign because of the application of filters to a particular segment or cell. For example, if a segment contains 1000 customers, and a filter causes 200 customers to be left out of the campaign, these 200 names could be saved along with an identification of the filter that caused their removal, so that the user can retrieve this information if needed.

25 Cells may include control cells (a random sample of a segment, forming a control group that can be used to evaluate effectiveness of selection techniques, test cells (included in the campaign but do not receive the offer), and generic cells (members receive the offers through the prescribed channels.

Module 706 is also able to identify the percent of duplicates among a set of selected cells, so that the user can be notified of such duplicates. Duplicate records among a set of previously selected cells may be displayed for the user if desired. Also, the user may specify that duplicates be removed from selected cells, or that a subset of such duplicates be removed.

Campaign manager module 706 maintains a link between cells 1103 and the parent segment from which the cells were derived. A database table is developed and stored, which contains descriptions of the unique attributes of each cell 1103. Such attributes include, for example:

- a description of the customer group being targeted in the cell
- the channel used to approach and contact the group described in the cell
- the treatment used to market to this group
- the allocated budget for the cell
- the expected results of the campaign for this cell
- the actual results (when available)

In one embodiment, these attributes are stored in the same table as the segment data itself.

Cells 1103 portion of marketing campaign 1101 shows the user the hierarchical organization of cells 1103, where appropriate. Offers 1104 associated with a cell are also displayed. The channels 1105 through which offers 1104 will be made are displayed. For each offer 1104, there is specified a list of acceptable actions the recipient of the offer may take. These include, for example, accepting the offer, requesting additional information, declining the offer, requesting removal from the list, and the like. Depending on the action taken, the recipient of an offer may or may not be included in subsequent campaigns.

Campaign manager module 706 also analyzes the response to offers 1104 in terms of success criteria, in order to derive a determination as to the overall success of the marketing campaign.

Offers 1104 that are associated with cells 1103 may be mutually exclusive in some cases (though not always). The user can specify such mutual exclusivity where appropriate, so that module 706 can take such factors into account when generating campaign 1101.

5   Offers 1104 output by module 706 also include the script to be used in making the offer. For example, in a direct mail channel the script is the text of the letter to be sent to the prospective customer. In a telephone solicitation channel, the script is the text that the customer support representative will read in communicating with the prospective customer. In an alternative embodiment, the offers 1104 output may

10   point to a script that is stored in some format, such as a Microsoft Word file for example.

Channels 1105 are specified for the offers 1104 being made. These may include, for example, direct mail, telemarketing, fulfillment, newspaper ads, and the like. For each channel, various treatments are specified depending on the nature of

15   the channel. These treatments describe distinct elements and specifications for executing the offer through the corresponding channel. Table 2 shows treatments for several examples of channels.

Channel	Corresponding Treatment Describes
Direct Mail	Contents of mailing package, creative offer, component costs
Telemarketing (inbound & outbound)	Vendor, scripts, offer, component costs
Fulfillment	Contents of fulfillment package, creative, application, offer, and component costs
Newspaper Ads	Publication, placement, circulation, creative, offer, and component costs

Table 2: Treatments for Several Examples of Channels

20

For each offer 1104, one or more possible actions can be specified. The user of the system can select from a master list of actions, as appropriate to the particular response of the customer. Such responses include, for example: "not interested",

"contact again in three months", "accept", "contact using another channel", and the like. For each such response, the user can define what actions should be taken. These can include, for example: making a different offer (perhaps increasing the incentive), scheduling for re-sending of the offer at a later time, changing the channel, and the

5   like. The system allows the user to specify the action for each expected customer response.

Campaign 1101 also contains a schedule 1106 describing when each offer 1104 will be made to members of a particular cell 1103. Schedule 1106 also identifies and displays to the user other campaigns that are running at the same time as the

10   campaign being created. Output can be generated, for example, by product, department, cell, segment, household, account, and/or customer. Such reports can be generated from available data by conventional report generation means.

Marketing campaign 1101 is provided as output 1107 to the user, to be displayed, printed, transmitted, and/or stored in a conventional manner. In one

15   embodiment, output 1107 takes the form of data files for supporting the back end of a direct marketing process. Output 1107 may include, for example, formats or templates for external direct mail production houses and call centers. These templates facilitate population of data fields, calculated values, tracking codes, and test fields.

20   For example, for a mailing, the templates might include form letters, where the customer name and address will be filled in for each customer before printing. For a telephone channel, the templates might be in the form of scripts to be followed by a telephone representative, as well as guidelines for handling interactions not covered in the script.

25   Additional support and output information may also be provided, such as freeze files (capture record identifiers and selected data elements at the time the campaign 1101, segment, and cell were created to facilitate more accurate response analysis and modeling) and longitudinal marketing files (identify permanent segments and marking records in the database for extended periods of time).

24

From the above description, it will be apparent that the invention disclosed herein provides a novel and advantageous system and method of planning and implementing customer relationship management. The foregoing discussion discloses and describes merely exemplary methods and embodiments of the present

5   invention. As will be understood by those familiar with the art, the invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. Accordingly, the disclosure of the present invention is intended to be illustrative, but not limiting, of the scope of the invention, which is set forth in the following claims.

CUSTOMER RELATIONSHIP MANAGEMENT SYSTEM AND METHOD

APPENDIX A:

5

BASE ATTRIBUTES FOR DATA MODEL

DERIVED ATTRIBUTES FOR DATA MODEL

10

General Attributes

Demographic_key
Age_band
Children
Income_band
Marital_status
Sex
Race
Occupation
Homeowner
Moved. last_6_months

Branch_key
Branch_address
Branch_city
Branch_name
Branch_state
Branch_state
Branch_SCF

Customer_key
First_name
Last_name
SSN
Birthday
Status
Customer_revenue
Customer_acquisition_cost
Customer_service_cost
Customer_retention_cost
Customer_profitability*
Marketing_budget

Prospect_key
First_name
Last_name
SSN
Birthday
Status
Marketing_budget
Syndicated data

Event_key
Event_type
Event_date
Household_member

Status_key
Closed_account_flag
New_account_flag
Status_description
Status_reason

Month_key
Account_key
Product_key
Branch_key
Household_key
Customer_key
Prospect_key
Demographic_key
Status_key
Checking_Accounts_key
Savings_Accounts_Regular_key
Savings_Accounts_IRA_key
CD_Regular_key
CD_IRA_key
Mortgage_key
Home_Equity_Line_key
Autoloan_key
Installment_loan_key
Line_of_Credit_key
Credit_card_key
Investments_Regular_key
Investments_IRA_key
Branch_Transactions_key
POS_Transactions_key
Wire_Transfers_key
Phone_Transactions_key
Mail_Transactions_key
PC_Transactions_key
ATM_Transactions_key
Credit_Card_Transactions_key
Events_key
Needs_key
Campaign_key
Promotional_history_key
Contact_history_key
FACTS IN EXCEL

Household_key
HH_type
HH_income
HH_head_name
HH_address
HH_city
HH_state
HH_zip
HH_revenue
HH_acquisition_cost
HH_service_cost
HH_retention_cost
HH_marketing_budget

Account_key
Account_address
Account_city
Account_state
Account_zip
Account_SCF
Account_age
Date_opened
Primary_age
Primary_marital
Primary_sex
Primary_surname
Secondary_surname

Needs_key
Need_description
Household_member

Product_key
Category
Product_description
Type

Month_key
Fiscal_quarter
Month
Year

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Accounts

Checking_Accounts_key
CA_date_opened
CA_campaign_response_flag
CA_channel_used
CA_location_opened
CA_initial_deposit
CA_interest_rate
CA_number_of_overdraft_credit_lines
CA_overdraft_limit
CA_number_of_ATM_cards
CA_stopped_checks_flag
CA_returned_checks_flag
CA_overdrafts_flag
CA_last_overdraft_credit_limit_increase

Savings_Accounts_Regular_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
interest_rate
total_interest_paid
annual_interest_paid
overdraft_limit
number_of_ATM_cards
overdrafts_flag
automatic_deposits_flag
automatic_withdrawal_flag
automatic_transfers_flag
fees_waived_flag
charges_waived_flag

Savings_Accounts_IRA_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
interest_rate
annual_interest_paid
total_interest_paid
overdraft_limit
number_of_ATM_cards
overdrafts_flag
automatic_deposits_flag
automatic_withdrawal_flag
automatic_transfers_flag
fees_waived_flag
charges_waived_flag
early_withdrawal_flag

Credit_card_key
card_type
expiration_date
annual_fee_amount
cc_VIP_account_flag
cc_frequent_flier_member_flag
last_card_mail_date
cc_direct_mail_flag
cc_telemarket_flag
cc_annual_fee_amount
cc_account_delinquency_flag
cc_last_credit_line_increase
cc_amount_of_last_credit_line_increase
cc_requested_last_credit_line_increase_flag
initiated_balance_transfer_in_flag
initiated_balance_transfer_out_flag
cc_dropped_credit_card
cc_stopped_credit_card_use

CD_Regular_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
CD_term
initial_deposit
interest_rate
months_until_maturity
fees_waived_flag
service_charges_waived_flag
fees_paid
service_charges_paid

CD_IRA_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
CD_term
initial_deposit
interest_rate
months_until_maturity
fees_waived_flag
service_charges_waived_flag
fees_paid
service_charges_paid
early_withdrawal_flag

Investments_Regular_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
gross_rate_of_return
tax_benefit
net_rate
Investment_type
Shares_held
Investments_annual_fee_amount
Investments_VIP_account_flag
Investments_credit_line
Investments_last_credit_line_increase
Investments_amount_of_last_credit_line_increase
Investments_requested_last_credit_line_increase_flag

Investments_IRA_key
date_opened
campaign_response_flag
channel_used
location_opened
initial_deposit
gross_rate_of_return
tax_benefit
net_rate
Investment_type
Shares_held
Investments_annual_fee_amount
Investments_VIP_account_flag
fees_waived_flag
service_charges_waived_flag
early_withdrawal_flag

Confidential and Proprietary

Loans (1)

Autoloan_key
date_opened
campaign_response_flag
channel_used
location_opened
amount_borrowed
interest_rate
term
months_to_maturity
collateral_value
monthly_payment
automatic_payment_flag
early_payment_flag
payment_method
30_day_delinquency_flag
60_day_delinquency_flag
90_day_delinquency_flag
120+_day_delinquency_flag

Mortgage_key
date_opened
campaign_response_flag
channel_used
location_opened
amount_borrowed
interest_rate
fixed_interest_rate_flag
variable_interest_rate_flag
term
months_to_maturity
mortgage_type
first_mortgage_amount
second_mortgage_amount
collateral_value
monthly_payment
automatic_payment_flag
early_payment_flag
payment_method
fees_waived_flag
service_charges_waived_flag
30_day_delinquency_flag
60_day_delinquency_flag
90_day_delinquency_flag
120+_day_delinquency_flag
credit_life_insurance_flag
credit_life_insurance_amount

Home_Equity_Line_key
date_opened
campaign_response_flag
channel_used
location_opened
amount_borrowed
interest_rate
fixed_interest_rate_flag
variable_interest_rate_flag
term
months_to_maturity
collateral_value
monthly_payment
automatic_payment_flag
early_payment_flag
payment_method
fees_waived_flag
service_charges_waived_flag
30_day_delinquency_flag
60_day_delinquency_flag
90_day_delinquency_flag
120+_day_delinquency_flag
last_credit_line_increase
amount_of_last_credit_line_increase
requested_last_credit_line_increase_flag
overlimits_flag
overlimit_max_amount
credit_life_insurance_flag
credit_life_insurance_amount

Installment_Loan_key
date_opened
campaign_response_flag
channel_used
location_opened
amount_borrowed
interest_rate
fixed_interest_rate_flag
variable_interest_rate_flag
term
months_to_maturity
collateral_value
monthly_payment
automatic_payment_flag
early_payment_flag
payment_method
fees_waived_flag
service_charges_waived_flag
30_day_delinquency_flag
60_day_delinquency_flag
90_day_delinquency_flag
120+_day_delinquency_flag
last_credit_line_increase
amount_of_last_credit_line_increase
requested_last_credit_line_increase_flag
overlimits_flag
overlimit_max_amount
credit_life_insurance_flag
credit_life_insurance_amount

Confidential and Proprietary

Loans (2)

Line_of_Credit_key
LOC_date_opened
LOC_campaign_response_flag
LOC_channel_used
LOC_location_opened
LOC_amount_borrowed
LOC_interest_rate
LOC_fixed_interest_rate_flag
LOC_variable_interest_rate_flag
LOC_term
LOC_credit_line_amount
LOC_annual_fee
LOC_months_until_renewal
LOC_collateral_value
LOC_monthly_payment
LOC_automatic_payment_flag
LOC_early_payment_flag
LOC_check_debits_flag
LOC_transfer_debits_flag
LOC_payment_method
LOC_fees_waived_flag
LOC_service_charges_waived_flag
LOC_30_day_delinquency_flag
LOC_60_day_delinquency_flag
LOC_90_day_delinquency_flag
LOC_120+_day_delinquency_flag
LOC_last_credit_line_increase
LOC_amount_of_last_credit_line_increase
LOC_requested_last_credit_line_increase_flag
LOC_overlimits_flag
LOC_overlimit_max_amount
LOC_credit_life_insurance_flag
LOC_credit_life_insurance_amount

Confidential and Proprietary

Transactions

Phone_Transactions_key
transaction_id
type
amount
date

Mail_Transactions_key
transaction_id
type
amount
date
origin

PC_Transactions_key
transaction_id
type
amount
date
origin

Wire_Transfers_key
transaction_id
type
amount
date
origin

Branch_Transactions_key
transaction_id
type
amount
date
location
campaign_response_flag

ATM_Transactions_key
transaction_id
type
amount
date
location
message_displayed
campaign_response_flag

Credit_Card_Transactions_key
transaction_id
type
amount
date
location
product_purchased
business_type

POS_Transactions_key
transaction_id
type
amount
date
location
business_type

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Campaigns

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Promotional_history_key
promotion_reason
product_type
Last_promotion_date
Last_promotion_channel
Last_promotion_resolution
Last_offer_accepted
Last_offer_accepted_date
Last_offer_accepted_channe[l]

Contact_history_key
Last_contact_date
Last_contact_reason
Last_contact_channel
Last_contact_description
Last_contact_product
Last_contact_resolution
Contacts_teller_reason_in_last_3_months
Contacts_teller_reason_in_last_6_months
Contacts_teller_reason_in_last_12_months
Contacts_VRU_reason_in_last_3_months
Contacts_VRU_reason_in_last_6_months
Contacts_VRU_reason_in_last_12_months
Contacts_CSR_reason_in_last_3_months
Contacts_CSR_reason_in_last_6_months
Contacts_CSR_reason_in_last_12_months
Contacts_Web_reason_in_last_3_months
Contacts_Web_reason_in_last_6_months
Contacts_Web_reason_in_last_12_months

Campaign_key
Campaign_description
Response_description
Start_date
End_date
Campaign_type (event, target_mkt)
Campaign_priority
Campaign_target
Campaign_offer
Campaign_budget
Targeted_population
Number_of_cells
Campaign_first_channel
FC_contact_date
FC_per_customer_cost
Campaign_second_channel
SC_contact_date
SC_per_customer_cost
Campaign_third_channel
TC_contact_date
TC_per_customer_cost
Response_channel
Offered_accepted_date

Reports
Customer value trend
Household value trend
Cross sell report for account, household, region, and branch
Household report
Product report
Account balance demographics by product
Product activity by quarter
Campaigns by month by geography
Campaigns by month
Campaign by geography
Campaigns by household type
Campaigns by risk level
Campaign/offer by customer (by month, by quarter, by year)
Campaign/offer by household (by month, by quarter, by year)
Campaign by type by time (month, quarter, year)
Campaigns by channel by time (month, quarter, year)
Campaigns by channel by household (or by customer)
Cost per contact
Cost of campaign by cell by channel
Campaign effectiveness by month
Campaign response by cell
Campaign response by geography
Campaign response by channel

Calculations

Household_profitability=Household_revenue-Σ (HH_acquisition_cost+HH_service_cost+HH_retention_cost)
    over all campaigns

Customer_profitability=Customer_revenue-Σ (Customer_acquisition_cost+Customer_service_cost+Customer_retention_cost)
    over all campaigns

Fact Table

Banking Model Measures
Customer Analytics Inc.
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Primary_balance
Branch_transaction_count*
Branch_transaction_types
Avg_branch_transaction_size*
Most_frequent_branch_transaction_time*
Most_frequent_branch_transaction_location*
Days_below_min_balance*
Days_overdrawn*
num_days_since_last_payment*
ratio_payments_to_balance*
ratio_current_balance_to_last_year_bal*
HH_relationship_age
HH_revenue
HH_acquisition_cost
HH_service_cost
HH_retention_cost
HH_profitability*
HH_marketing_budget
HH_future_profitability_score
HH_risk_score
HH_LTV_score
HH_attrition_score
HH_profitability*
HH_attitudinal_segment
HH_behavioral_segment
HH_lifestyle_segment
HH_actifity_segment
HH_attitudinal_segment
HH_behavioral_segment
HH_lifestyle_segment
HH_probability_of_accept_CD_offer
HH_probability_of_accept_IRA_offer
HH_probability_of_accept_homeq_offer
HH_probability_of_accept_savings_offer
HH_Max_number_of_campaigns*
HH_Min_ number_of_campaigns*
Customer_relationship_age
Customer_acquisition_cost
Customer_service_cost
Customer_retention_cost
Customer_profitability*
Customer_marketing_budget
Customer_future_profitability_score
Customer_risk_score
Customer_LTV_score

Fact Table

Customer_attrition_score
Customer_attitudinal_segment
Customer_acquisition_cost
Customer_lifestyle_segment
Customer_activity_segment
Customer_needs_segment
Customer_adhoc_segment
Customer_probability_of_accept_card_offer
Customer_probability_of_accept_CD_offer
Customer_probability_of_accept_IRA_offer
Customer_probability_of_accept_homeq_offer
Customer_probability_of_accept_savings_offer
Customer_Max_number_of_campaigns*
Customer_Min_ number_of_campaigns*
CC_profit_score
CC_segmentation_lifestyle_score
CC_segmentation_behavior_score
CC_segmentation_attitude_score
CC_segmentation_activity_score
CC_attrition_score
CC_segmentation_lifestyle_score
CC_segmentation_behavior_score
CC_segmentation_attitude_score
CC_segmentation_activity_score

Accounts
Number of Accounts
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Accounts
Balance

Fact Table

Net Balance (Deposits - Loans)
Transactions (Credits + Debits)
Business Volume (Deposits + Loans)
Number of Transactions
Transaction Volume
Transaction Size
Credits
Number of Credits
Credit Volume
Credit Size
Number of Credits as a % of Number of Transactions
Credit Volume as a % of Transaction Volume
Credit Volume as a % of Business Volume
Debits
Number of Debits
Debit Volume
Debit Size
Debit Number of as a % of Number of Transactions
Debit Volume as a % of Transaction Volume
Debit Volume as a % of Business Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Number of Transactions
Fee/Service Charge Volume as a % of Transaction Volume
Fee/Service Charge Volume as a % of Business Volume
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Number of Transactions
Fee/Service Charge Waived Volume as a % of Transaction Volume
Fee/Service Charge Waived Volume as a % of Business Volume

Accounts

Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings

Fact Table

Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate Deposits

Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume.
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume
Cash Deposit Size
Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits
Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals

Fact Table

Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume
Transfer Withdrawal Size
Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts

Number of Accounts

Fact Table

Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
Overdraft Credit Line
Number of Overdraft Credit Lines
Percentage of Checking Accounts covered by Overdraft Line
Total Line Size of Overdraft Credit Line
Average Line Size of Overdraft Credit Line
ATM Cards
Number of ATM Cards
Percentage of Accounts linked with ATM Card(s)
Percentage of Account Balances linked with ATM Card(s)
Deposits
Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume
Cash Deposit Size
Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits

Fact Table

Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals
Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume
Transfer Withdrawal Size
Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Stopped Checks
Number of Stopped Checks

Fact Table

Stopped Check Volume
Stopped Check Size
Stopped Checks as a % of Total Checks
Stopped Check Volume as a % of Total Check Volume
Returned Checks
Number_of_Returned_Checks
Returned Check Volume
Returned Check Size
Returned Checks as a % of Total Checks
Returned Check Volume as a % of Total Check Volume
Overdrafts
Number of Overdrafts
Overdraft Volume
Overdraft Size
Overdrafts as a % of Total Checks
Overdraft Volume as a % of Total Check Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts

Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate

Fact Table

ATM Cards
Number of ATM Cards
Percentage of Accounts linked with ATM Card(s)
Percentage of Account Balances linked with ATM Card(s)
Deposits
Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume .
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume
Cash Deposit Size
Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits
Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals

Fact Table

Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume
Transfer Withdrawal Size
Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts

Number of Accounts

Fact Table

Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
ATM Cards
Number of ATM Cards
Percentage of Accounts linked with ATM Card(s)
Percentage of Account Balances linked with ATM Card(s)
Deposits
Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume
Cash Deposit Size
Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits
Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits

Fact Table

Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions .
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals
Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume
Transfer Withdrawal Size
Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance

Fact Table

Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings .
Number of Account Closings as a % Total Accounts
Interest Rate
Term
Months Until Maturity
Percentage Auto Renewal
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts
Number of Accounts

Fact Table

Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
Term
Months Until Maturity
Percentage Auto Renewal
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Rate of Return

Fact Table

Gross Rate
Tax Benefit
Net Rate
Investment Mix
Bonds
Government
Corporate
Mutual Funds
Government Bond
Corporate Bond
Blue Chip
Mid-Cap
Small-Cap
Technology
Transportation
Health Care
Other Sector
International
Stocks
Blue Chip
Mid-Cap
Small-Cap
Technology
Transportation
Health Care
Other Sector
International
Other
Trades
Number of Trades
Trade Volume
Trade Size
Number of Trades as a % of Total Transactions
Trade Volume as a % of Total Transaction Volume
Trade Volume as a % of Balance
ATM Cards
Number of ATM Cards
Percentage of Accounts linked with ATM Card(s)
Percentage of Account Balances linked with ATM Card(s)
Deposits
Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume

Fact Table

Cash Deposit Size
Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits
Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals
Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume

Fact Table

Transfer Withdrawal Size
Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Rate of Return
Gross Rate

Fact Table

Tax Benefit
Net Rate
Investment Mix
Bonds
Government
Corporate
Mutual Funds
Government Bond
Corporate Bond
Blue Chip
Mid-Cap
Small-Cap
Technology
Transportation
Health Care
Other Sector
International
Stocks
Blue Chip
Mid-Cap
Small-Cap
Technology
Transportation
Health Care
Other Sector
International
Other
Trades
Number of Trades
Trade Volume
Trade Size
Number of Trades as a % of Total Transactions
Trade Volume as a % of Total Transaction Volume
Trade Volume as a % of Balance
ATM Cards
Number of ATM Cards
Percentage of Accounts linked with ATM Card(s)
Percentage of Account Balances linked with ATM Card(s)
Deposits
Number of Deposits
Deposit Volume
Deposit Size
Number of Deposits as a % of Total Transactions
Deposit Volume as a % of Total Transaction Volume
Deposit Volume as a % of Balance
Cash Deposits
Number of Cash Deposits
Cash Deposit Volume
Cash Deposit Size

Fact Table

Cash Deposit Number of as a % of Deposit Number of
Cash Deposit Volume as a % of Deposit Volume
Check Deposits
Number of Check Deposits
Check Deposit Volume
Check Deposit Size
Check Deposits Number of as a % of Deposits Number of
Check Deposit Volume as a % of Deposit Volume
Transfer Deposits
Number of Transfer Deposits
Transfer Deposit Volume
Transfer Deposit Size
Transfer Deposit Number of as a % of Deposit Number of
Transfer Deposit Volume as a % of Deposit Volume
Direct Deposits
Number of Direct Deposits
Direct Deposit Volume
Direct Deposit Size
Direct Deposit Number of as a % of Deposit Number of
Direct Deposit Volume as a % of Deposit Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Deposit Number of
POS Credit Volume as a % of Deposit Volume
Withdrawals
Number of Withdrawals
Withdrawal Volume
Withdrawal Size
Withdrawal Number of as a % of Total Transactions
Withdrawal Volume as a % of Total Transaction Volume
Withdrawal Volume as a % of Balance
Cash Withdrawals
Number of Cash Withdrawals
Cash Withdrawal Volume
Cash Withdrawal Size
Cash Withdrawal Number of as a % of Withdrawal Number of
Cash Withdrawal Volume as a % of Withdrawal Volume
Check Withdrawals
Number of Check Withdrawals
Check Withdrawal Volume
Check Withdrawal Size
Check Withdrawal Number of as a % of Withdrawal Number of
Check Withdrawal Volume as a % of Withdrawal Volume
Transfer Withdrawals
Number of Transfer Withdrawals
Transfer Withdrawal Volume
Transfer Withdrawal Size

Fact Table

Transfer Withdrawal Number of as a % of Withdrawal Number of
Transfer Withdrawal Volume as a % of Withdrawal Volume
Direct Debits
Number of Direct Debits
Direct Debit Volume
Direct Debit Size
Direct Debit Number of as a % of Withdrawal Number of
Direct Debit Volume as a % of Withdrawal Volume
POS Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Withdrawal Number of
POS Debit Volume as a % of Withdrawal Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
Fixed

Fact Table

Variable	
Contract Amount	
Contract Amount	
Contract Amount as a % of Total Exposure	
Term	
Months to Maturity	
Collateral (Secured Loans)	
Collateral Value	
Collateral as a % of Balance	
Collateral as a % of Contract Amount	
Credit Line (Lines of Credit)	
Total Line	
Average Line	
Line as a % of Total Exposure	
Line Increase (Lines of Credit)	
Utilization (Lines of Credit)	Number of Line Increases
Line Increase Volume	
Average Line Increase	
Number of Line Increases as a % of Accounts	
Line Increase Volume as a % of Line	
Utilization (Lines of Credit)	
Utilization Rate	
Average Utilization	
Utilization as a % of Total Utilization	
Payments	
Number of Payments	
Payment Volume	
Average Payment Size	
Number of Payments per Account	
Payment Volume as a % of Minimum Amount Due	
Payment Volume as a % of Balance	
Payment Volume as a % of Total Payment Volume	
Cash Payments	
Number of Cash Payments	
Cash Payment Volume	
Cash Payment Size	
Cash Payment Number of as a % of Payment Number of	
Cash Payment Volume as a % of Payment Volume	
Check Payments	
Number of Check Payments	
Check Payment Volume	
Check Payment Size	
Check Payments Number of as a % of Payments Number of	
Check Payment Volume as a % of Payment Volume	
Transfer Payments	
Number of Transfer Payments	
Transfer Payment Volume	
Transfer Payment Size	
Transfer Payment Number of as a % of Payment Number of	

Fact Table

Transfer Payment Volume as a % of Payment Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Payment Number of
POS Credit Volume as a % of Payment Volume
Debits (Lines of Credit)
Number of Debits
Debit Volume
Average Debit Size
Number of Debits per Account
Debit Volume as a % of Line
Debit Volume as a % of Balance
Debit Volume as a % of Total Debit Volume
Cash Debits (Lines of Credit)
Number of Cash Debits
Cash Debit Volume
Cash Debit Size
Cash Debit Number of as a % of Debit Number of
Cash Debit Volume as a % of Debit Volume
Merchandise POS Debits (Lines of Credit)
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Debit Number of
POS Debit Volume as a % of Debit Volume
Check Debits (Lines of Credit)
Number of Check Debits
Check Debit Volume
Check Debit Size
Check Debit Number of as a % of Debit Number of
Check Debit Volume as a % of Debit Volume
Transfer Debits (Lines of Credit)
Number of Transfer Debits
Transfer Debit Volume
Transfer Debit Size
Transfer Debit Number of as a % of Debit Number of
Transfer Debit Volume as a % of Debit Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume

Fact Table

Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
Overlimits (Lines of Credit)
Number of Overlimits
Overlimit Volume
Average Overlimit
Number of Overlimits as a % of Accounts
Overlimit Volume as a % of Line
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
Behavior Score
Line Increase Requests (Lines of Credit)
Number of Increase Requests
Amount Requested
% Increase Requests Granted
% Amount Requested Granted
% Increase Requests Declined

Fact Table

Accounts
Number of Accounts
Balance
Average Balance
Equity
Number of Accounts as a % of Total Accounts
Balance as a % of Contract Amount
Balance as a % of Total Loan Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Contract Amount
Contract Amount
Contract Amount as a % of Total Exposure
Term
Months to Maturity
Collateral
Collateral Value
Collateral as a % of Balance
Collateral as a % of Contract Amount
Interest Rate
Fixed
Variable
Payments
Number of Payments
Payment Volume
Average Payment Size
Number of Payments per Account
Minimum Payment Amount
Payment Volume as a % of Minimum Amount Due
Payment Volume as a % of Balance
Payment Volume as a % of Total Payment Volume
Cash Payments
Number of Cash Payments
Cash Payment Volume
Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size
Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume

Fact Table

Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
Behavior Score

Fact Table

Credit Life Insurance
Number of Accounts Covered
% of Accounts Covered
% of Balances Covered

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
Fixed
Variable
Collateral (Equity)
Collateral Value
Collateral as a % of Balance
Collateral as a % of Credit Line
Credit Line
Total Line
Average Line
Line as a % of Total Exposure
Line Increase
Number of Line Increases
Line Increase Volume
Average Line Increase
Number of Line Increases as a % of Accounts
Line Increase Volume as a % of Line
Utilization
Utilization Rate
Average Utilization
Utilization as a % of Total Utilization
Payments
Number of Payments
Payment Volume
Average Payment Size
Number of Payments per Account
Payment Volume as a % of Minimum Amount Due
Payment Volume as a % of Balance
Payment Volume as a % of Total Payment Volume

Fact Table

Cash Payments
Number of Cash Payments
Cash Payment Volume
Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size
Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume
Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Payment Number of
POS Credit Volume as a % of Payment Volume
Debits
Number of Debits
Debit Volume
Average Debit Size
Number of Debits per Account
Debit Volume as a % of Line
Debit Volume as a % of Balance
Debit Volume as a % of Total Debit Volume
Check Debits
Number of Check Debits
Check Debit Volume
Check Debit Size
Check Debit Number of as a % of Debit Number of
Check Debit Volume as a % of Debit Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size

Fact Table

Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
Overlimits
Number of Overlimits
Overlimit Volume
Average Overlimit
Number of Overlimits as a % of Accounts
Overlimit Volume as a % of Line
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
Behavior Score
Line Increase Requests
Number of Increase Requests
Amount Requested
% Increase Requests Granted
% Amount Requested Granted
% Increase Requests Declined
Credit Life Insurance
Number of Accounts Covered
% of Accounts Covered
% of Balances Covered

Fact Table

██

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Contract Amount
Balance as a % of Total Loan Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings   .
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Contract Amount
Contract Amount
Contract Amount as a % of Total Exposure
Term
Months to Maturity
Collateral
Collateral Value
Collateral as a % of Balance
Collateral as a % of Contract Amount
Interest Rate
Fixed
Variable
Payments
Number of Payments
Payment Volume
Average Payment Size
Number of Payments per Account
Minimum Payment Amount
Payment Volume as a % of Minimum Amount Due
Payment Volume as a % of Balance
Payment Volume as a % of Total Payment Volume
Cash Payments
Number of Cash Payments
Cash Payment Volume
Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size

Fact Table

Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume
Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance

Fact Table

Utilization Rate
Behavior Score
Credit Life Insurance
Number of Accounts Covered
% of Accounts Covered
% of Balances Covered

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Contract Amount
Balance as a % of Total Loan Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Contract Amount
Contract Amount
Contract Amount as a % of Total Exposure
Term
Months to Maturity
Collateral
Collateral Value
Collateral as a % of Balance
Collateral as a % of Contract Amount
Interest Rate
Fixed
Variable
Payments
Number of Payments
Payment Volume
Average Payment Size
Number of Payments per Account
Minimum Payment Amount
Payment Volume as a % of Minimum Amount Due
Payment Volume as a % of Balance
Payment Volume as a % of Total Payment Volume
Cash Payments
Number of Cash Payments
Cash Payment Volume

Fact Table

Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size
Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume
Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance

Fact Table

Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
Behavior Score
Credit Life Insurance
Number of Accounts Covered
% of Accounts Covered
% of Balances Covered

Accounts
Number_of_Accounts
Balance
cc_Total_Months_Zero_Balance
cc_Total_Months_Zero_Spending
cc_Average_Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
CC_number_of_inquiries_last_6_months
CC_interest_paid_in_last_6_months
CC_over_limit_fee_amount_in_last_6_months
CC_late_fee_amount_paid_in_last_6_months
CC_Number_of_Retail_Transactions_Last_6_Months
CC_Number_of_Travel_Transactions_Last_6_Months
CC_Number_of_Restaurant_Transactions_Last_6_Months
CC_Number_Cash_Advance_Transactions_Last_6_Months
CC_Total_Retail_Transactions_Amount_Last_6_Months
CC_Total_Travel_Transactions_Amount_Last_6_Months
CC_Total_Restaurant_Transactions_Amount_Last_6_Months
CC_Total_Cash_Advance_Transactions_Amount_Last_6_Months
CC_Total_Cash_Advance_Fee_Amount_Last_6_Months
Account Openings
Number_of_Account_Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Number_of_months_since_first_opening
Number_of_months_since_last_opening
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate

Fact Table

Cash Rate
Merchandise Rate
Credit Line
cc_Total_Line
Average Line
Line as a % of Total Exposure
Number of Line Increases
Line Increase Volume
Average Line Increase
Number of Line Increases as a % of Accounts
Line Increase Volume as a % of Line
Utilization
cc_Utilization_Rate
cc_Average_Utilization
Utilization as a % of Total Utilization
cc_Total_Months_Zero_Utililzation
Number of Cards
Number of Cards
Average Number of Cards
Annual Fee
Fee
Average Fee
Months Until Renewal
No Fee Accounts
Fee Accounts
Payments
Number_of_Payments
Payment_Volume
Months_of_Zero_Payments
Months_of_Full_Payment
Average_Payment_Size
Number_of_Payments_per_Account
Payment_Volume_as_Percent_Minimum_Amount_Due
Payment_Volume_as_Percent_of_Balance
Payment_Volume_as_Percent_of_Total_Payment_Volume
Cash Payments
Number_of_Cash_Payments
Cash_Payment_Volume
Cash_Payment_Size
Cash_Payment_Number_Percent_of_Payment_Number
Cash_Payment_Volume_as_Percent_of_Payment_Volume
Check Payments
Number_of_Check_Payments
Check_Payment_Volume
CC_number_of_returned_checks_in_last_6_months
Check_Payment_Size
Check_Payments_Number_as_Percent_of_Payments_Number
Check_Payment_Volume_as_Percent_of_Payment_Volume
Transfer Payments

Fact Table

Number_of_Transfer_Payments
Transfer_Payment_Volume
Transfer_Payment_Size
Transfer_Payment_Number_as_Percent_of_Payment_Number
Transfer_Payment_Volume_as_Percent_of_Payment_Volume
POS Credit Volume as a % of Payment Volume
Debits
Number of Debits
Debit Volume
Average Debit Size
Number of Debits per Account
Debit Volume as a % of Line
Debit Volume as a % of Balance
Debit Volume as a % of Total Debit Volume
Cash Debits
Number of Cash Debits
Cash Debit Volume
Cash Debit Size
Cash Debit Number of as a % of Debit Number of
Cash Debit Volume as a % of Debit Volume
Merchandise Debits
Number of POS Debits
POS Debit Volume
POS Debit Size
POS Debit Number of as a % of Debit Number of
POS Debit Volume as a % of Debit Volume
Check Debits
Number of Check Debits
Check Debit Volume
Check Debit Size
Check Debit Number of as a % of Debit Number of
Check Debit Volume as a % of Debit Volume
Transfer Debits
Number of Transfer Debits
Transfer Debit Volume
Transfer Debit Size
Transfer Debit Number of as a % of Debit Number of
Transfer Debit Volume as a % of Debit Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size

Fact Table

Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
Overlimits
Number of Overlimits
Overlimit Volume
Average Overlimit
Number of Overlimits as a % of Accounts
Overlimit Volume as a % of Line
30 Day Delinquency
Number_of_Times
Number_of_Accounts
Balances
Average_Balance
Number_of_Accounts_as_percent_of_Total_Accounts
Balances_as_percent_of_Total_Balance
Utilization_Rate
60 Day Delinquency
Number_of_Times
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number_of_Times
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number_of_Times
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
Behavior Score
Line Increase Requests
Number of Increase Requests
Amount Requested
% Increase Requests Granted
% Amount Requested Granted
% Increase Requests Declined
Credit Life Insurance

Fact Table

Number of Accounts Covered
% of Accounts Covered
% of Balances Covered
Credit Card Registry
Number of Accounts Covered
% of Accounts Covered

Accounts
Number of Accounts
Balance
Average Balance
Number of Accounts as a % of Total Accounts
Balance as a % of Total Balance
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Interest Rate
Cash Rate
Merchandise Rate
Credit Line
Total Line
Average Line
Line as a % of Total Exposure
Line Increase
Number of Line Increases
Line Increase Volume
Average Line Increase
Number of Line Increases as a % of Accounts
Line Increase Volume as a % of Line
Utilization
Utilization Rate
Average Utilization
Utilization as a % of Total Utilization
Annual Fee
Fee
Average Fee
Months Until Renewal
No Fee Accounts
Fee Accounts
Payments
Number of Payments

Fact Table

Payment Volume
Average Payment Size
Number of Payments per Account
Payment Volume as a % of Minimum Amount Due
Payment Volume as a % of Balance
Payment Volume as a % of Total Payment Volume
Cash Payments
Number of Cash Payments
Cash Payment Volume
Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size
Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume
Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
POS Credits
Number of POS Credits
POS Credit Volume
POS Credit Size
POS Credit Number of as a % of Payment Number of
POS Credit Volume as a % of Payment Volume
Debits
Number of Debits
Debit Volume
Average Debit Size
Number of Debits per Account
Debit Volume as a % of Line
Debit Volume as a % of Balance
Debit Volume as a % of Total Debit Volume
Check Debits
Number of Check Debits
Check Debit Volume
Check Debit Size
Check Debit Number of as a % of Debit Number of
Check Debit Volume as a % of Debit Volume
Transfer Debits
Number of Transfer Debits
Transfer Debit Volume
Transfer Debit Size
Transfer Debit Number of as a % of Debit Number of

Fact Table

Transfer Debit Volume as a % of Debit Volume
Fees and Service Charge Debits
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Debits Number of
Fee/Service Charge Volume as a % of Debit Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Debit Number of
Fee/Service Charge Waived Volume as a % of Debit Volume
Fee/Service Charge Waived Volume as a % of Balance
Overlimits
Number of Overlimits
Overlimit Volume
Average Overlimit
Number of Overlimits as a % of Accounts
Overlimit Volume as a % of Line
30 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
60 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
90 Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate
120 + Day Delinquency
Number of Accounts
Balances
Average Balance
Number of Accounts as a % of Total Accounts
Balances as a % of Total Balance
Utilization Rate

Fact Table

Behavior Score
Line Increase Requests
Number of Increase Requests
Amount Requested
% Increase Requests Granted
% Amount Requested Granted
% Increase Requests Declined
Credit Life Insurance
Number of Accounts Covered
% of Accounts Covered
% of Balances Covered

Accounts
Number of Accounts
Cash Value
Average Cash Value
Number of Accounts as a % of Total Accounts
Cash Value as a % of Total Cash Value
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Premium
Coverage Amount
Payments
Number of Payments
Payment Volume
Payment Size
Number of Payments as a % of Total Transactions
Payment Volume as a % of Total Transaction Volume
Payment Volume as a % of Cash Value
Cash Payments
Number of Cash Payments
Cash Payment Volume
Cash Payment Size
Cash Payment Number of as a % of Payment Number of
Cash Payment Volume as a % of Payment Volume
Check Payments
Number of Check Payments
Check Payment Volume
Check Payment Size

Fact Table

Check Payments Number of as a % of Payments Number of
Check Payment Volume as a % of Payment Volume
Transfer Payments
Number of Transfer Payments
Transfer Payment Volume
Transfer Payment Size
Transfer Payment Number of as a % of Payment Number of
Transfer Payment Volume as a % of Payment Volume
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Cash Value
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size
Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Cash Value

Other Products and Services

Safe Deposit Boxes
Number of Accounts
Number of Accounts as a % of Total Accounts
Account Openings
Number of Account Openings
Number of Account Openings as a % Total Account Openings
Number of Account Openings as a % Total Accounts
Account Closings
Number of Account Closings
Number of Account Closings as a % Total Account Closings
Number of Account Closings as a % Total Accounts
Fees and Service Charges
Number of Fees/Service Charges
Fee/Service Charge Volume
Average Fee/Service Charge Size
Fee/Service Charge Number of as a % of Total Transaction Number of
Fee/Service Charge Volume as a % of Total Transaction Volume
Fee/Service Charge Volume as a % of Balance
Fees and Service Charges Waived
Number of Fees/Service Charges Waived
Fee/Service Charge Waived Volume
Average Fee/Service Charge Waived Size

Fact Table

Fee/Service Charge Waived Number of as a % of Total Transaction Number of
Fee/Service Charge Waived Volume as a % of Total Transaction Volume
Fee/Service Charge Waived Volume as a % of Balance
Other miscellaneous attributes
Campaign_break_even_target_percentage*
Campaign_total_cost*
Campaign_gross_profit*
Investments_number_of_trades_last_3_months*
Investments_number_of_trades_last_6_months*
Investments_number_of_trades_last_12_months*
Investments_risk_score
Investments_profit_score
Investments_segmentation_lifestyle_score
Investments_segmentation_behavior_score
Investments_segmentation_attitude_score
Investments_attrition_score
Investments_attrition_decile
Investmens_direct_mail_flag
Investments_telemarket_flag
Investments_over_limit_last_6_months
Offers_accepted_in_last_3_months
Offers_received_in_last_3_months
Offers_accepted_in_last_6_months
Offers_received_in_last_6_months
Offers_accepted_in_last_12_months
Offers_received_in_last_12_months
Contacts_teller_in_last_3_months
Contacts_teller_in_last_6_months
Contacts_teller_in_last_12_months
Contacts_VRU_in_last_3_months
Unresolved_contacts_VRU_in last_3_months
Contacts_VRU_in_last_6_months
Unresolved_contacts_VRU_in last_6_months
Contacts_VRU_in_last_12_months
Unresolved_contacts_VRU_in last_12_months
Contacts_CSR_in_last_3_months
Unresolved_contacts_CSR_last_3_months
Contacts_CSR_in_last_6_months
Unresolved_contacts_CSR_last_6_months
Contacts_CSR_in_last_12_months
Unresolved_contacts_CSR_last_12_months
Contacts_Web_in_last_3_months
Unresolved_contacts_Web_last_3_months
Contacts_Web_in_last_6_months
Unresolved_contacts_Web_last_6_months
Contacts_Web_in_last_12_months
Unresolved_contacts_Web_last_12_months

What is Claimed is:

1.   A computer-implemented customer relationship management method, comprising the steps of:

a)   defining goals and constraints for a marketing campaign;

b)   defining market segments and validating defined goals and constraints;

c)   designing the marketing campaign responsive to results of a) and b);

d)   executing the designed marketing campaign;

e)   capturing responses; and

f)   analyzing campaign results from e);

wherein each of the steps is executed by a computer.

2.   A computer-implemented customer relationship management system, comprising:

a computer-implemented specification module, for defining goals and constraints for a marketing campaign;

a computer-implemented analysis module, coupled to the specification module, for defining segments and validating goals and constraints;

a computer-implemented design module, coupled to the analysis module and the specification module, for designing the campaign based on [the] results of the specification module and the analysis module; and

a computer-implemented execution module, coupled to the design module, for generating output for the marketing campaign.

3.   The system of claim 2, further comprising:

a computer-implemented tracking module, coupled to the execution module, for capturing responses and analyzing campaign results.

4.   The method of claim 1, wherein step a) comprises the substeps of:

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a.1)   defining an overall goal for the marketing campaign;

a.2)   defining at least one constraint for the marketing campaign; and

a.3)   defining a set of customers for the marketing campaign.

5.   The method of claim 4, wherein substep a.1) comprises defining a target value for a variable, the target variable representing a business goal.

6.   The method of claim 4, wherein substep a.2) comprises defining at least one constraint for a parameter of the marketing campaign.

7.   The method of claim 4, wherein step a) further comprises the substep of:

a.4)   specifying a budget for the marketing campaign.

8.   The method of claim 1, wherein step b) comprises the substeps of:

b.1)   performing an exploratory analysis;

b.2)   defining a plurality of market segments to be targeted by the marketing campaign, each segment having characteristics;

b.3)   scoring the defined market segments according to a scoring metric; and

b.4)   validating the defined constraints.

9.   The method of claim 8, wherein substep b.1) comprises performing a break-even analysis of the marketing campaign.

10.   The method of claim 8, wherein substep b.3) comprises applying a correlation model to determine relationships among market segment characteristics.

11.   The method of claim 10, wherein the correlation model comprises a predictive model.

12.   The method of claim 8, wherein substep b.3) comprises applying a
dependency network to determine relationships among market segment character-   .
istics.

13.   The method of claim 8, wherein step b) further comprises the substeps

5   of:

b.2.1) determining at least one marketing method for the marketing
        campaign; and

b.2.2) determining at least one marketing channel for the marketing
        campaign.

10   14.   The method of claim 8, wherein substep b.4) comprises determining
whether application of the defined constraints results in conflicts.

15.   The method of claim 1, wherein step c) comprises the substeps of:

c.1)   selecting one of the defined market segments;

c.2)   dividing the selected market segment into a plurality of cells;

15   c.3)   for each of at least a subset of the cells, defining a marketing promotion
        and associating the defined marketing promotion with the cell.

16.   The method of claim 15, wherein substep c.2) further comprises refining
at least one of the cells.

20   17.   The method of claim 1, wherein step d) comprises the substeps of:

d.1)   specifying an output format for the marketing campaign;

d.2)   developing a campaign schedule; and

d.3)   outputting data to at least one marketing channel according to the
        designed marketing campaign, using the specified output format.

25   18.   The method of claim 1, wherein:

step a) comprises defining goals and constraints for the marketing campaign

by specifying positions in a multidimensional space representing values

for target variables;

and wherein step f) comprises the substeps of:

5   f.1)   determining customer positions in the multidimensional space by

measuring values of variables associated with the customers; and

f.2)   comparing the determined customer positions with the specified

positions for the defined goals.

19.   The method of claim 1, further comprising the step of:

10   g)   adjusting the designed marketing campaign responsive to results of f).

20.   A computer-implemented customer relationship management system,

comprising:

a computer-implemented customer database, containing data describing

customers and potential customers;

15   a computer-implemented data model, coupled to the customer database, for

accessing and interpreting data from the customer database;

a computer-implemented data access layer, coupled to the data model, for

accessing data from the data model;

' a computer-implemented segmentation module, coupled to the data access

20   layer, for generating market segments;

a computer-implemented report analysis and data mining module, coupled to

the segmentation module, for determining scores for market segments;

a computer-implemented campaign manager, coupled to the data access layer,

for producing a marketing campaign; and

25   an output device, coupled to the campaign manager, for outputting the

marketing campaign.

21.   The system of claim 20, further comprising:

a graphical user interface, coupled to the campaign manager, for accepting

user input regarding the marketing campaign.

22.   The system of claim 20, wherein the segmentation module generates

5   market segments using statistical clustering.

23.   The system of claim 20, further comprising:

a computer-implemented predictive model library, coupled to the report

analysis and data mining module, for providing predictive models for

application to data from the data model.

10   24.   The system of claim 23, wherein the segmentation module generates

market segments using predictive models from the predictive model library.

25.   The system of claim 23, wherein the report analysis and data mining

module determines a scored segments set based on application of the predictive

model library to at least one segment.

15   26.   The system of claim 20, wherein the campaign manager generates a

marketing campaign including at least one selected from the group consisting of:

cells;

offers;

channels; and

20   schedules.

27.   The system of claim 20, wherein the campaign manager analyzes

responses to determine relative success of the marketing campaign.

28.   A computer-implemented customer relationship management system,

comprising:

computer-implemented specification means for defining goals and constraints

for a marketing campaign;

computer-implemented analysis means, coupled to the specification means, for

defining market segments and validating defined goals and constraints;

5   computer-implemented design means, coupled to the analysis means, for

designing the marketing campaign responsive to results of the

specification means and the analysis means; and

computer-implemented execution means, coupled to the design means, for

executing the designed marketing campaign.

10   29.   The computer-implemented customer relationship management system

of claim 28, further comprising:

computer-implemented tracking means, coupled to the execution means, for

capturing responses and analyzing campaign results.

30.   The computer-implemented customer relationship management system

15   of claim 28, wherein the specification means comprises:

computer-implemented goal definition means for defining an overall goal for

the marketing campaign;

computer-implemented constraint definition means for defining at least one

constraint for the marketing campaign; and

20   computer-implemented customer definition means for defining a set of

customers for the marketing campaign.

31.   The method of claim 28, wherein the analysis means comprises:

computer-implemented exploratory analysis means for performing an

exploratory analysis;

25   computer-implemented market segment definition means, for defining a

plurality of market segments to be targeted by the marketing campaign,

each segment having characteristics;

computer-implemented scoring means, coupled to the market segment

definition means, for scoring the defined market segments according to

a scoring metric; and

computer-implemented validation means, for validating the defined

5   constraints.

32.   The method of claim 28, wherein the design means comprises:

computer-implemented segment selection means, for selecting one of the

defined market segments;

computer-implemented cell division means, coupled to the segment selection

10   means, for dividing the selected market segment into a plurality of cells;

and

computer-implemented promotion definition means, coupled to the cell

division means, for, for each of at least a subset of the cells, defining a

marketing promotion and associating the defined marketing promotion

15   with the cell.

33.   The method of claim 28, wherein the execution means comprises:

computer-implemented output specification means, for specifying an output

format for the marketing campaign;

computer-implemented scheduling means, for developing a campaign

20   schedule; and

computer-implemented output means, coupled to the output specification

means and to the scheduling means, for outputting data to at least one

marketing channel according to the designed marketing campaign,

using the specified output format.

25   34.   A computer program product comprising a computer-usable medium

having computer-readable code embodied therein for customer relationship

management, comprising:

83

computer-readable program code devices configured to cause a computer to
define goals and constraints for a marketing campaign;

computer-readable program code devices configured to cause a computer to
define market segments and validate defined goals and constraints;

5   computer-readable program code devices configured to cause a computer to
design the marketing campaign responsive to results of the computer-
readable program code devices configured to cause a computer to
define goals and constraints for a marketing campaign and the
computer-readable program code devices configured to cause a com-

10   puter to define market segments and validate defined goals and
constraints; and

computer-readable program code devices configured to cause a computer to
execute the designed marketing campaign.

35.   The computer program product of claim 34, further comprising:

15   computer-readable program code devices configured to cause a computer to
capture responses and analyze campaign results.

36.   The computer program product of claim 34, wherein the computer-
readable program code devices configured to cause a computer to define goals and
constraints for a marketing campaign comprise:

20   computer-readable program code devices configured to cause a computer to
define an overall goal for the marketing campaign;

computer-readable program code devices configured to cause a computer to
define at least one constraint for the marketing campaign; and

computer-readable program code devices configured to cause a computer to

25   define a set of customers for the marketing campaign.

37.   The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to define market segments and validate defined goals and constraints comprise:

    computer-readable program code devices configured to cause a computer to perform an exploratory analysis;

    computer-readable program code devices configured to cause a computer to define a plurality of market segments to be targeted by the marketing campaign, each segment having characteristics;

    computer-readable program code devices configured to cause a computer to score the defined market segments according to a scoring metric; and

    computer-readable program code devices configured to cause a computer to validate the defined constraints.

38.   The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to design the marketing campaign comprise:

    computer-readable program code devices configured to cause a computer to select one of the defined market segments;

    computer-readable program code devices configured to cause a computer to divide the selected market segment into a plurality of cells; and

    computer-readable program code devices configured to cause a computer to, for each of at least a subset of the cells, define a marketing promotion and associate the defined marketing promotion with the cell.

39.   The computer program product of claim 34, wherein the computer-readable program code devices configured to cause a computer to execute the designed marketing campaign comprise:

    computer-readable program code devices configured to cause a computer to specify an output format for the marketing campaign;

computer-readable program code devices configured to cause a computer to

    develop a campaign schedule; and

computer-readable program code devices configured to cause a computer to

    output data to at least one marketing channel according to the designed

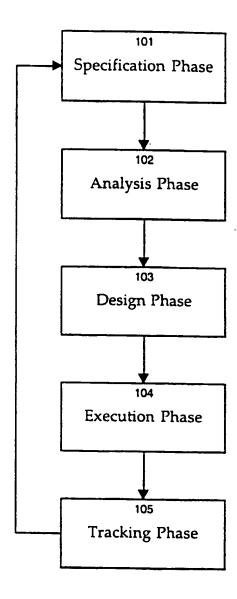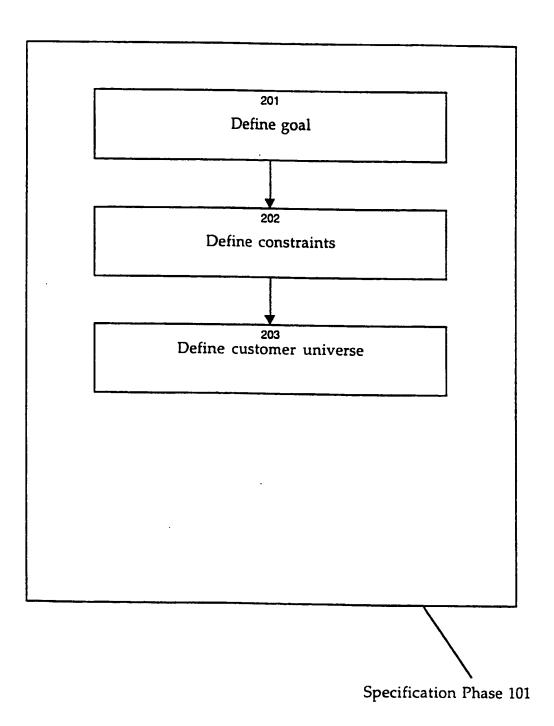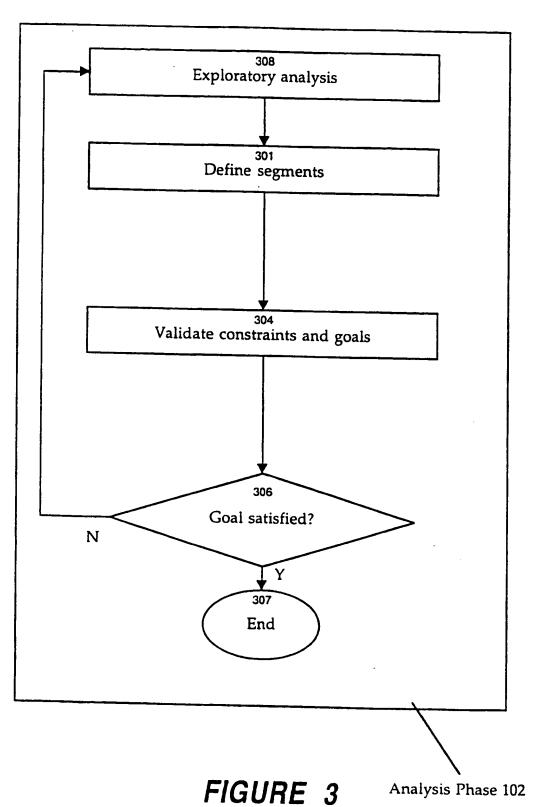5   marketing campaign, using the specified output format.

FIGURE 1

Specification Phase 101

FIGURE 2

```
┌─────────────────────────────────────────────────────────┐
│                                                           │
│          ┌─────────────────────────────────┐             │
│   ┌─────▶│             308                  │             │
│   │      │       Exploratory analysis       │             │
│   │      └─────────────────────────────────┘             │
│   │                      │                                │
│   │                      ▼                                │
│   │      ┌─────────────────────────────────┐             │
│   │      │             301                  │             │
│   │      │        Define segments           │             │
│   │      └─────────────────────────────────┘             │
│   │                      │                                │
│   │                      │                                │
│   │                      ▼                                │
│   │      ┌─────────────────────────────────┐             │
│   │      │             304                  │             │
│   │      │  Validate constraints and goals  │             │
│   │      └─────────────────────────────────┘             │
│   │                      │                                │
│   │                      ▼                                │
│   │              ╱────────────╲                           │
│   │            ╱       306       ╲                        │
│   └──────────◀   Goal satisfied?   ▶                     │
│           N    ╲                  ╱                       │
│                  ╲──────────────╱                         │
│                      │  Y                                 │
│                      ▼                                    │
│                  ╭─────────╮                              │
│                  │   307   │                              │
│                  │   End   │                              │
│                  ╰─────────╯                              │
│                                                           │
└─────────────────────────────────────────────────────────┘
```

FIGURE 3   Analysis Phase 102

Design Phase 103

FIGURE 4

501
Specify output format

502
Develop schedule

503
Deliver data to channels
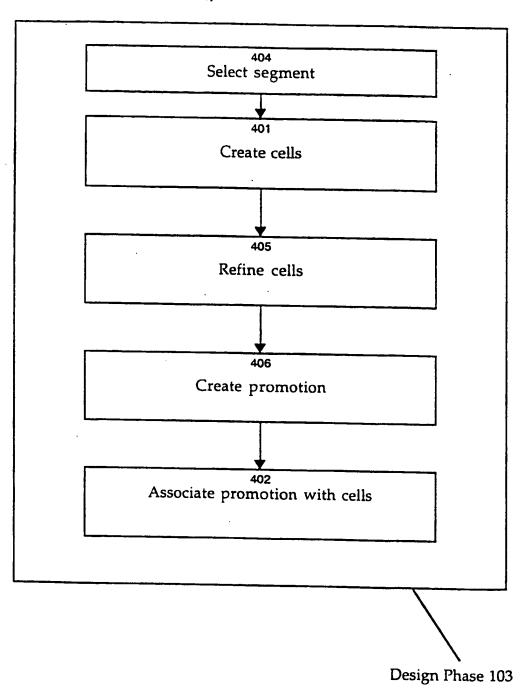
Execution Phase 104

FIGURE 5

FIGURE 6

FIGURE 7

707 Graphical User Interface

706 Campaign Manager

705 Report Analysis and Data Mining

901 Predictive Model Library

704 Segmentation

703 Data Access Layer

702 Data Model

701 Customer Data Mart
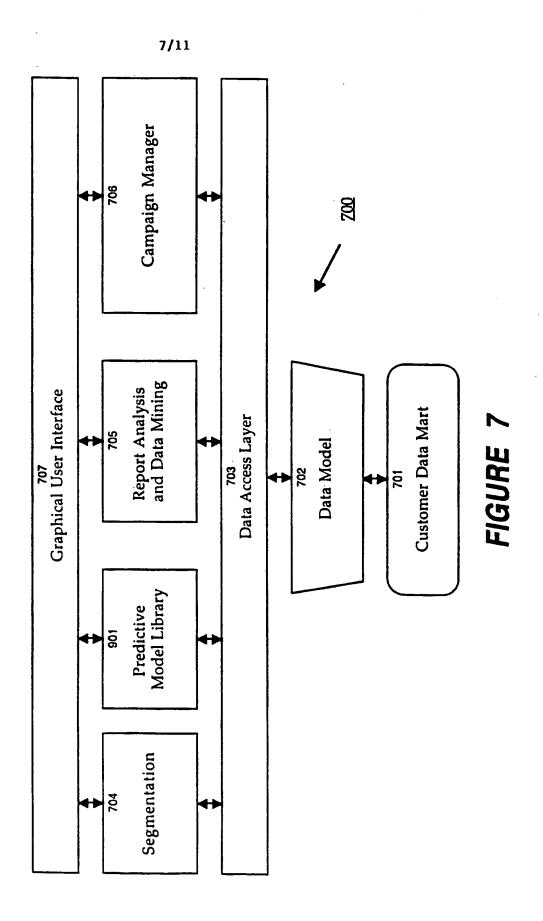
700

FIGURE 8

FIGURE 9

```
┌─────────────────────────────────────┐
│               1001                   │
│           Select model               │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1002                   │
│           Select data set            │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1003                   │
│      Select attributes from data set │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1004                   │
│   Identify attributes having special │
│              meaning                 │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1005                   │
│   Check that selected data and       │
│   attributes conform to specification│
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1006                   │
│           Apply model                │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1007                   │
│   Compare model's predictions to     │
│          known responses             │
└─────────────────────────────────────┘
                  │
                  ▼
┌─────────────────────────────────────┐
│               1008                   │
│   User compares results; accepts or  │
│          rejects model               │
└─────────────────────────────────────┘
```

FIGURE 10

FIGURE 11